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(71) Applicant: **Pianetti, Francesco  
20013 Magenta (IT)**

(72) Inventor: **Pianetti, Francesco  
20013 Magenta (IT)**

(74) Representative: **De Bortoli, Tiziano et al  
Notarbartolo & Gervasi S.p.A.  
Corso di Porta Vittoria, 9  
20122 Milano (IT)**

### (54) TOOTHBRUSH ADAPTED TO PREVENT THE FORMATION OF DENTAL PLAQUE AND TARTAR

(57) The present invention relates to a toothbrush (1) for preventing the formation of dental plaque and tartar. The toothbrush comprises a supporting area (4) for bristles (5) connected to a handle (2) which extends along a longitudinal axis (101). Such a handle comprises a first side (2') and a second side (2''), which are opposite to each other. The first side defines a first recessed portion (10) which extends from the supporting area. The second side defines a further recessed portion (20) which is at least partially longitudinally staggered with respect to the first recessed portion of the first side of the handle.

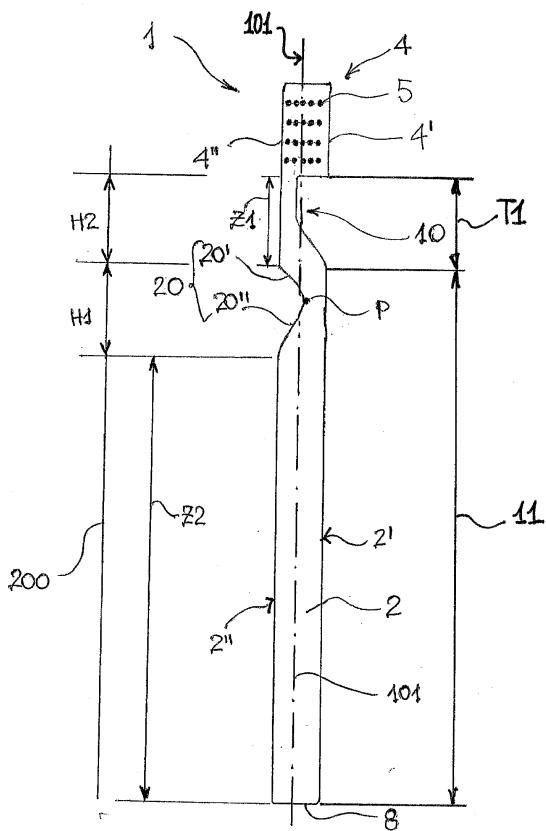


Fig. 1

**Description****FIELD OF THE INVENTION**

**[0001]** The present invention falls within the scope of the provision of instruments for oral hygiene. In particular, the present invention relates to a toothbrush which can be used for preventing the formation of dental plaque and tartar. The toothbrush according to the invention allows a more accurate cleaning of the inner side of the lower dental arch as compared to the known solutions from the prior art.

**BACKGROUND ART**

**[0002]** As is known, dental plaque and the problem of tartar affect most people, regardless of their age. It is known that dental plaque and tartar are mainly deposited at the inner side of the lower dental arch. This phenomenon is due to the presence of several saliva glands in this region, whereby a certain amount of saliva is created and stagnates there.

**[0003]** It has been noted that most known toothbrushes from the prior art do not allow to prevent effectively the deposition of dental plaque and tartar on the inner side of the lower dental arch. This limitation results from the shape and structure of traditional toothbrushes being not adapted to reach and treat this dental area effectively.

**[0004]** A partial solution to the problem mentioned was proposed in Patent Application EP0957709 to the same Applicant. Such a patent describes a toothbrush comprising a handle and a supporting head for the cleaning bristles. A recessed portion which extends from the supporting head toward the free end of the handle is defined on one of the handle sides. The presence of such a recessed portion in fact makes the toothbrush effective for cleaning the front and left-hand portions of the inner side of the lower dental arch.

**[0005]** However, it has been noted that the toothbrush described in EP0957709 does not allow an acceptable or in any case sufficient cleaning of the right-hand portion of the inner side of the lower dental arch for a correct prevention. Indeed, the presence alone of the above-described recessed region does not allow the toothbrush to be placed in a position which is useful for cleaning such a "right-hand portion".

**[0006]** In contrast, it has been noted that in the attempt to clean this portion with the toothbrush of EP0957709, a user is caused to brush his/her teeth in an improper manner, namely "from the top downwards", i.e. from his/her teeth toward the gum. In this regard, the dental prevention guidelines have clearly established that, for a correct prevention, teeth cleaning should always be done through a movement of the toothbrush bristles performed from the gum toward the teeth, i.e. inverted with respect to what a user does in the "right-hand portion" with the toothbrush described in EP0957709.

**[0007]** In view of the above disclosure, it is the main

object of the present invention to provide a toothbrush which allows to overcome the drawbacks mentioned above. Within the scope of this task, it is a primary object to provide a toothbrush which allows a correct cleaning of the whole inner side of the lower dental arch. It is another object of the present invention to provide a toothbrush which facilitates the user in the correct cleaning of his/her teeth according to the dental prevention guidelines. Not last, it is the object of the present invention to provide a toothbrush which is reliable and easy to be manufactured at competitive costs.

**SUMMARY**

**[0008]** The present invention relates to a toothbrush adapted to prevent the formation of dental plaque and tartar. The toothbrush according to the invention comprises a supporting area for bristles for cleaning teeth. Such a supporting area is connected to a handle which extends along a longitudinal axis. Such a handle comprises a first side and a second side, which are opposite to each other. A first recessed portion which extends from the supporting area is defined on the first side. The toothbrush is characterised in that a second recessed portion is configured to allow the positioning of the head of the toothbrush at the right-hand portion of the inner side of the lower dental arch is defined on the second side of the handle.

**[0009]** Overall, the two recessed portions, which are defined on opposite sides of the toothbrush handle, advantageously allow the complete and accurate cleaning of the whole lower dental arch, thus overcoming any limitations of known toothbrushes.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0010]** Further features and advantages of the present invention will become more apparent from the following detailed description, provided by way of non-limiting example and shown in the accompanying drawings, in which:

- Figure 1 is a front view of a first possible embodiment of a toothbrush according to the invention;
- Figure 2 is a front view of a second possible embodiment of a toothbrush according to the invention;
- Figure 3 is a perspective view of the toothbrush in Figure 1.

**[0011]** The same parts and the same corresponding components are indicated with the same numbers in the drawings.

**DETAILED DESCRIPTION OF THE INVENTION**

**[0012]** With reference to the mentioned drawings, toothbrush 1 according to the invention comprises a supporting area 4, hereinafter also referred to as "head 4",

which carries bristles 5 by means of which the teeth are cleaned. In this regard, in accordance with the dental prevention guidelines, such a cleaning should always be done through a movement of the bristles from the gums toward the tooth and not vice versa. This is in order to maintain the integrity of the gums themselves. According to a known solution, head 4 defines a substantially flat surface 3 from which the bristles 5 emerge according to an orientation direction 201 which is substantially orthogonal to the surface itself.

**[0013]** Toothbrush 1 further comprises a handle 2 which defines a rectilinear longitudinal extension axis 101. Handle 2 is connected to said head 4 while extending therefrom up to a free end 8. Handle 2 has a first side 2' and a second side 2", which are opposite to each other. For the purposes of the invention, the first side 2' and the second side 2" are meant as the sides of handle 2 which extend substantially on surfaces parallel to the orientation direction 201 of the bristles 5 indicated above, and preferably substantially parallel to the longitudinal axis 101. A first recessed portion 10 of handle 2 which extends from the supporting area 4 toward the free end 8 of handle 2 is defined on the first side 2'. Such a first portion 10 is defined in accordance with the principles described in Patent EP0957709 indicated above to which reference is made. Toothbrush 1 according to the present invention is characterised in that it comprises a second recessed portion 20 of handle 2 defined on the second side 2" of handle 2.

**[0014]** It has been noted that this second recessed portion 20 allows the insertion and correct orientation of the head 4 of toothbrush 1 at the right-hand portion of the inner side of the lower dental arch. In other words, a toothbrush is provided through this second recessed portion 20 which finally allows a user to obtain a complete and accurate cleaning of the inner side of the lower dental arch. Moreover, the presence of this second recessed portion puts the user in the condition of carrying out such a cleaning in accordance with the dental prevention guidelines indicated above.

**[0015]** According to a first embodiment shown in Figure 1, the second portion 20 is longitudinally staggered with respect to the first portion 10. This means that the projection H1 of the second portion 20 along a reference line 200, which is parallel to the longitudinal axis 101, does not overlap the projection H2 of the first portion 10 along the same reference line 200.

**[0016]** According to an alternative embodiment shown in Figure 2, the second portion 20 is instead only partially staggered in longitudinal direction with respect to the first portion. Here, this instead means that the projection H1 of the second portion 20 along a reference line 200 which is parallel to the longitudinal axis 101, does partially overlap the projection H2 of the first portion 10 along the same reference line 200.

**[0017]** According to another aspect, head 4 comprises a first longitudinal side 4' and a second longitudinal side 4", which are opposite and parallel to each other. Such

sides 4', 4" are "*longitudinal*" because they are parallel to the longitudinal extension direction 101 of handle 2. According to one possible embodiment shown in Figure 1, the first side 4' is aligned with a rectilinear portion 11 of the first side 2' of handle 2. Such a rectilinear portion 11 is preferably defined between said first recessed portion 10 and the end 8 of handle 2.

**[0018]** With reference to Figure 2, according an alternative embodiment, the first side 4' of head 2 is misaligned with respect to the first side 2' of handle 2. In particular, head 2 has a width (indicated with L1) which is greater than the width (indicated with L2) of handle 2. Such widths (L1, L2) are measured along a direction which is substantially orthogonal to the longitudinal direction 101.

**[0019]** According to a further aspect, the first recessed portion 10 extends over a longitudinal section (indicated with T1 in Figure 1) of 2 or 3 cm, measured between head 4 and the rectilinear portion 11 of the first side 2' of the handle 2.

**[0020]** As indicated in Figures 1 and 2, according to the invention, the second portion 20 is in any case always defined between a first rectilinear section Z1 and a second rectilinear section Z2 of the second side 2" of handle 2. The first rectilinear section Z1 and the second rectilinear section Z2 are coplanar and therefore aligned along the same direction parallel to the longitudinal axis 101.

**[0021]** Such a second portion 20 extends over a longitudinal section having an extension between 5 and 20 mm. The expression "*extension of the longitudinal section of the second portion 20*" means precisely the measurement of projection H1 along a reference line 200 which is parallel to the longitudinal axis 101 (as already indicated above). It is noted again from Figures 1 and 2 that in both the embodiments shown, the second longitudinal side 4" of head 4 is aligned with the two sections Z1, Z2 of the second side 2" of handle 2.

**[0022]** According to a further object of the present invention, the second recessed portion 20 has a substantially concave profile with an inflection point "P" defined in a position which is proximal to the longitudinal extension axis 101 of said handle 2. The profile of the second portion 20 may take various shapes. For example, in the embodiment shown in Figure 2, the second portion 20 has a middle part 20' and two arc-of-circle side parts 20" which are opposite to each other. Each side part 20" extends from said middle part 20' to a corresponding rectilinear section Z1, Z2 of the second side 2' of handle 2.

**[0023]** In the case in Figure 1, instead, the second portion 20 is defined by two portions 20', 20" having a different curvature, which are joined close to the inflection point P. In general terms, although the shape of the second portion 20 is variable in shape, it should be such as to allow the positioning and correct movement of the toothbrush at the right-hand portion of the inner side of the lower dental arch.

**[0024]** For the purposes of the invention, the expression "*recessed portion*" (10 or 20) generally means a por-

tion of handle 2 which is substantially concave, i.e. shaped so as to be "recessed" toward the longitudinal axis 101 with respect to a corresponding side 2', 2" of handle 2.

**[0025]** According to a further object of the present invention, head 4 and handle 2 are integrally defined in a single piece and preferably comprise reinforcing fibres, at least as regards the region of handle 2. Such fibres are used to provide a mechanical reinforcement in the handle region between the two recessed portions 10,20.

**[0026]** It is worth noting that in the above-described embodiments, the toothbrush shown in the drawings is intended for a right-handed person. Obviously, for a left-handed person, the toothbrush will thus have a mirroring shape to that shown in the figures while however maintaining the peculiarities described above.

**[0027]** The embodiments implemented for the toothbrush according to the invention allow the preset task and objects to be wholly met. In particular, the toothbrush allows to prevent the formation of plaque and tartar on both dental arches and in particular along the entire extension of the inner side of the lower dental arch. In other words, the toothbrush according to the invention is perfectly usable for cleaning all dental surfaces.

## Claims

1. Toothbrush (1) adapted to prevent the formation of dental plaque and tartar, comprising a supporting area (4) for bristles (5) connected to a handle (2) that defines a rectilinear longitudinal extension axis (101), said handle (2) comprising a first side (2') and a second side (2") opposite each other, wherein said first side (2') defines a first recessed portion (10) that extends from said supporting area (4), **characterised in that** said second side (2") of said handle (2) defines a second recessed portion (20) for positioning of said toothbrush (1) on the inner side of the lower dental arch.
2. Toothbrush (1) according to claim 1, wherein said second portion (20) is completely staggered, in longitudinal direction, with respect to said first recessed portion (10).
3. Toothbrush (1) according to claim 1, wherein said second portion (20) is only partly staggered, in longitudinal direction, with respect to said first recessed portion (10).
4. Toothbrush (1) according to claim 1, 2 or 3, wherein said first side (2') defines a further rectilinear portion (11) between said first recessed portion (10) and a free end (8) of said handle (2).
5. Toothbrush (1) according to any one of claims 1 to 4, wherein said supporting area (4) comprises a first

side (4') and a second side (4") opposite each other and substantially parallel to said longitudinal axis (101).

5. 6. Toothbrush (1) according to claim 5, wherein said first side (4') of said supporting area (4) is aligned with said further rectilinear portion (11) of said first side (2') of said handle (2) or wherein said first side (4') of said supporting area (4) is misaligned with said second rectilinear portion (11) of said first side (2').
7. Toothbrush (1) according to claim 5 or 6, wherein said second portion (20) extends between a first rectilinear section (Z1) and a second rectilinear section (Z2) of said second side (2') of said handle (2), said second side (2") of said supporting area (4) being aligned with said rectilinear sections (Z1, Z2) of said second side (2') of said handle (2).
8. Toothbrush (1) according to any one of claims 1 to 7, wherein said second recessed portion (20) extends for a longitudinal section having an extension between 5 and 20 mm.
9. Toothbrush (1) according to any one of claims 1 to 8, wherein said second recessed portion (20) has a concave profile with an inflection point (P) in position proximal to said longitudinal axis (101) of said handle (2).
10. Toothbrush (1) according to any one of claims 1 to 9, wherein said toothbrush (1) is made of a material comprising reinforcing fibres.

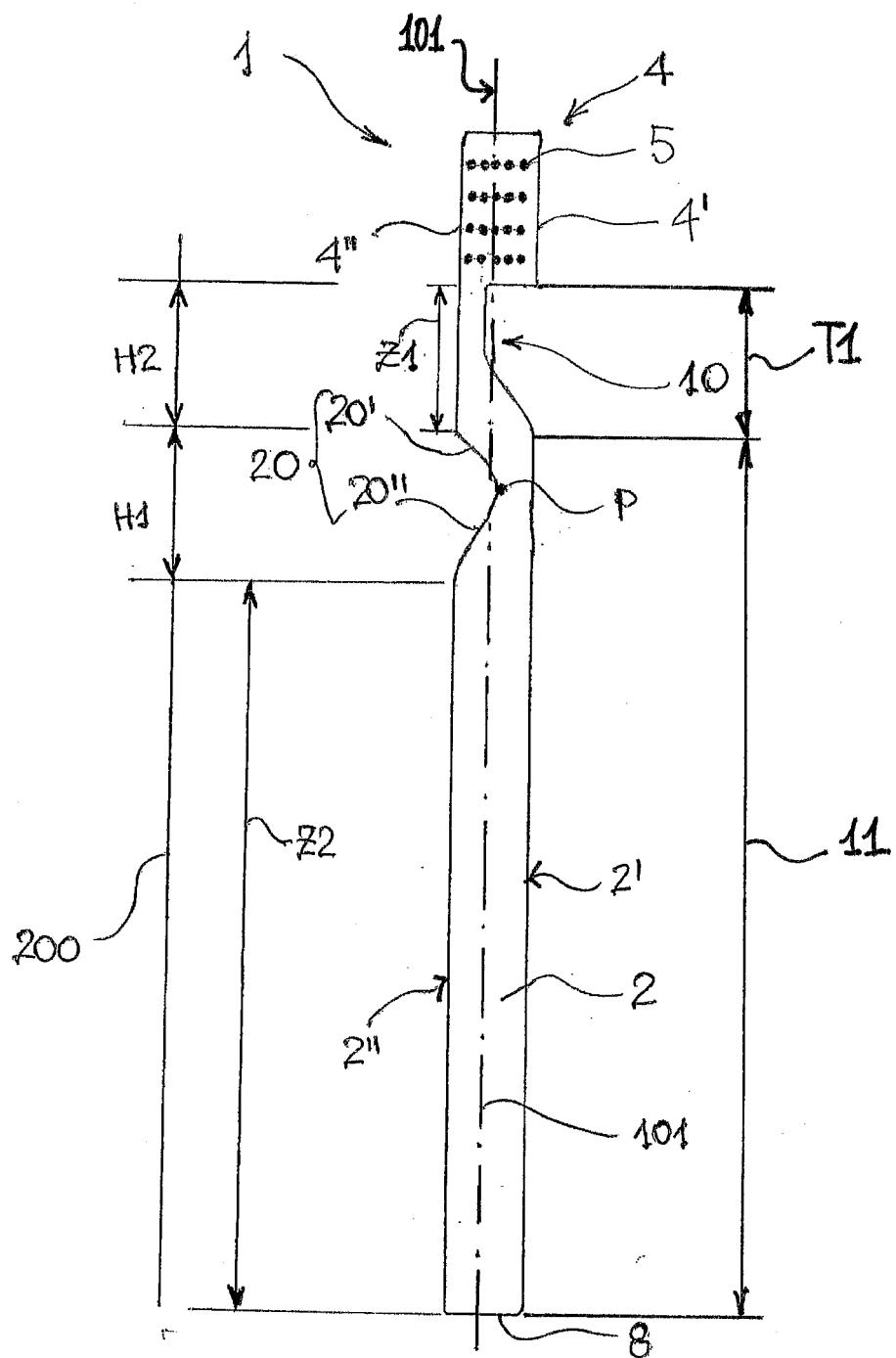


Fig. 1

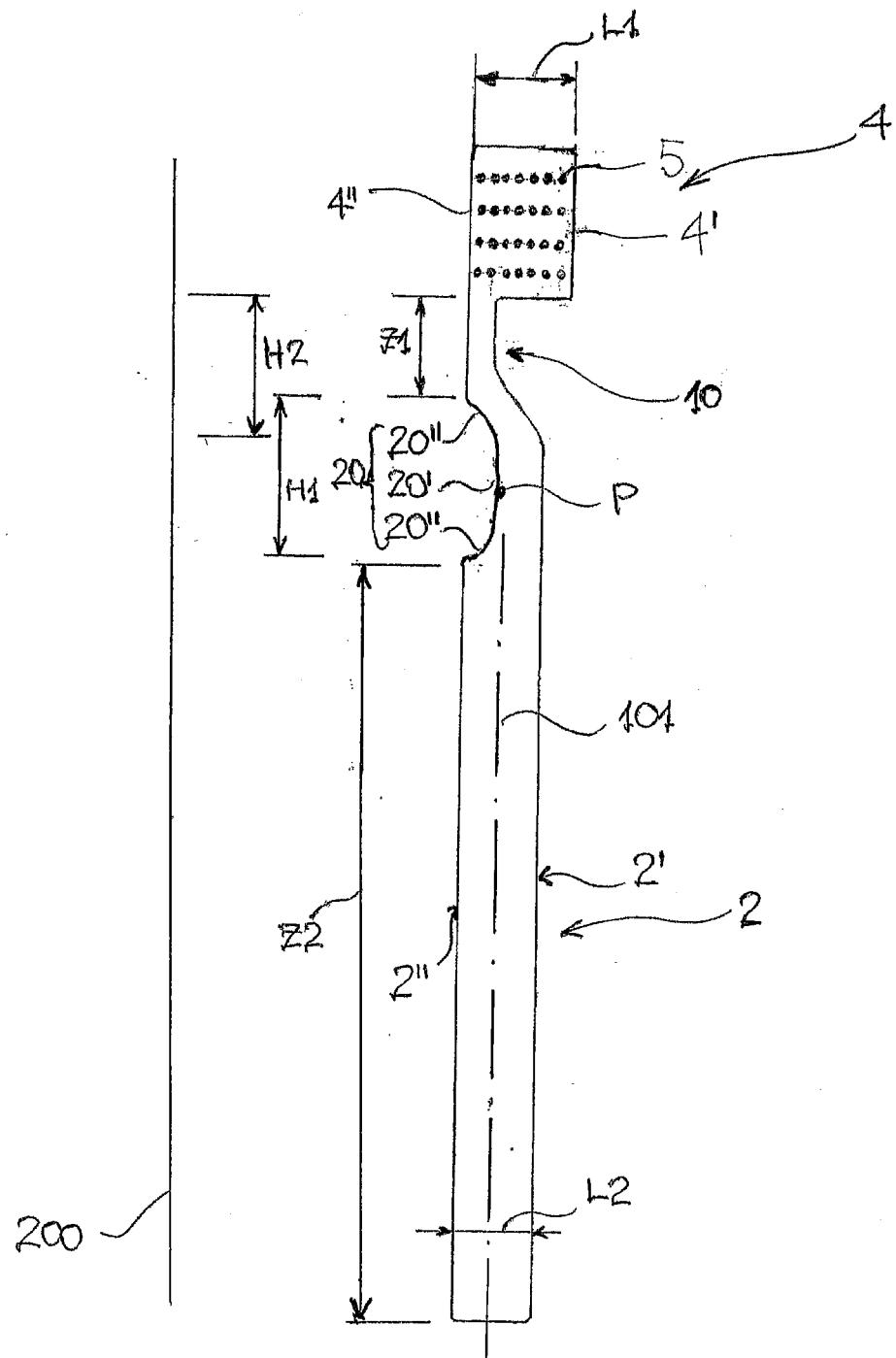


Fig. 2

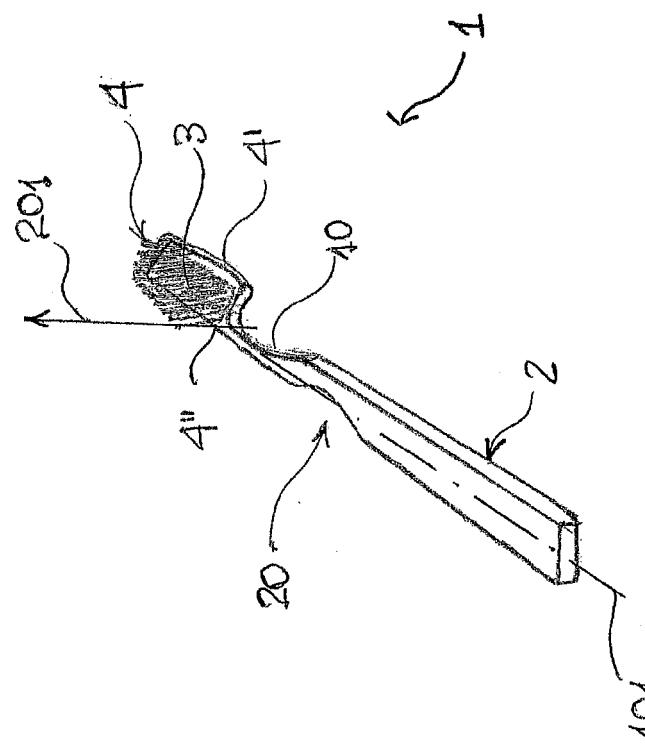


Fig. 3



## EUROPEAN SEARCH REPORT

**Application Number**

EP 16 17 1472

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim			
X	FR 646 729 A (RHEIN) 15 November 1928 (1928-11-15)	1,2,5-9	INV. A46B5/02		
Y	* page 1, paragraph 1; claim 1; figure 1 *	3,4,10			
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Y	US 2007/277339 A1 (BARSHESHER MICHAEL [IL]) 6 December 2007 (2007-12-06)	3,4			
A	* claim 1; figure 18B *	1,2,5-10			
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Y	US 2005/108841 A1 (EDWARDS STEVEN J [US]) 26 May 2005 (2005-05-26)	10			
A	* paragraph [0042]; claim 1 *	1-9			
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			TECHNICAL FIELDS SEARCHED (IPC)		
			A46B		
The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
The Hague	12 October 2016	Dal Bó, Paolo			
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12-10-2016

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
	FR 646729 A 15-11-1928	NONE		
15	US 2007277339 A1 06-12-2007	NONE		
	US 2005108841 A1 26-05-2005	NONE		

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- EP 0957709 A [0004] [0005] [0006] [0013]